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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Artcle 36 and Rule 70)

Applicant's or agent's file reference 03PCP0006	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. **PCT/KR2003/000631**	International filing date *(day/month/year)* **28 MARCH 2003 (28.03.2003)**	Priority date *(day/month/year)* 29 MARCH 2002 (29.03.2002)
International Patent Classification (IPC) or national classification and IPC **IPC7 C07H 21/00**		
Applicant **CREAGENE INC. et al**		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

   ☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of _____ sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demamd	Date of completion of this report
24 OCTOBER 2003 (24.10.2003)	22 JUNE 2004 (22.06.2004)
Name and mailing address of the IPEA/KR Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer AHN, Kyu Jeong Telephone No. 82-42-481-5026

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International aplication No.
PCT/KR2003/000631

I. Basis of the report

1. With regard to the elements of the international application:*

- [X] the international application as originally filed
- [ ] the description:
  - pages _____ , as originally filed
  - pages _____ , filed with the demand
  - pages _____ , filed with the letter of _____
- [ ] the claims:
  - pages _____ , as originally filed
  - pages _____ , as amended (together with any statment) under Article 19
  - pages _____ , filed with the demand
  - pages _____ , filed with the letter of _____
- [ ] the drawings:
  - pages _____ , as originally filed
  - pages _____ , filed with the demand
  - pages _____ , filed with the letter of _____
- [ ] the sequence listing part of the description:
  - pages _____ , as originally filed
  - pages _____ , filed with the demand
  - pages _____ , filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language English which is

- [ ] the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- [X] the language of publication of the international application(under Rule 48.3(b)).
- [ ] the language of the translation furnished for the purposes of international preliminary examination(under Rules 55.2 and/ or 55.3).

3. With regard to any **nucleotide** and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- [X] contained inthe international application in written form.
- [X] filed together with the international application in computer readable form.
- [ ] furnished subsequently to this Authority in written form.
- [ ] furnished subsequently to this Authority in computer readable form
- [ ] The statement that the subsequently furnished written sequence listing does not go beyond the disc losure in the international applicationas as filed has been furinshed.
- [ ] The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. [ ] The amendments have resulted in the cancellation of:
   - [ ] the description, pages _____
   - [ ] the claims, Nos. _____
   - [ ] the drawings, sheet _____

5. [ ] This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box(Rule 70.2(c)).**

* *Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed." and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).*

** *Any replacement sheet containing such amendments must be referred to under item I and annexed to this report.*

INTERNATIONAL PRELIMINARY EXAMINATION

International aplication No.
PCT/KR2003/000631

V. **Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	1-20	YES
	Claims	None	NO
Inventive step (IS)	Claims	1-2, 4, 8, 13, 17	YES
	Claims	3, 5-7, 9-12, 14-16, 18-20	NO
Industrial applicability (IA)	Claims	1-20	YES
	Claims	None	NO

2. Citations and explanations (Rule 70.7)

The following documents have been considered for the purpose of this report:

D1: US 6361939 B1 (26 March 2002)
D2: J. of Biol. Chem., Vol. 276(21): 17920-17931 (2001)
D3: Gene Accession number AL354813 (16 May 2001)
D4: Gene Accession number AF067844 (08 February 1999)

The present invention relates to polynucleotides highly expressed in subsets of dendritic cells (DCs) and matured DCs, and microarrays comprising the same. These polynucleotides are characterized by the expression in CD11-DCs from peripheral blood, $CD1a^+$ or $CD14^+$ DCs generated from $CD34^+$ progenitor cells isolated from umbilical cord blood.

Novelty

D1 and D2 disclose polynucleotides encoding DC-specific proteins associated with DC differentiation and maturation. D2 also discloses the analysis of the expression profile of human CD14+ blood monocytes and their derived DCs using DNA microarrays.

The polynucleotides of SEQ ID NOs: 4 and 6 of this invention was published in the NCBI database (D3; D4) before the priority date (29 March 2002) as a part of the genomic sequence. Said polynucleotides are disclosed in D3 and D4 merely as a part of the genomic sequence without any function. In addition, the DC-specific expression of said polynucleotides is not mentioned in D3 and D4.

None of prior art discloses the DC-specific polynucleotides consisting of SEQ ID No: 1, 3, 4, 5, or 6.

Thus, the novelty of this invention can be acknowledged (PCT Article 33(2)).

(Continued on Supplemental Sheet.)

Supplemental Box
(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of:

BoxV. 2.

Inventive Step

Claims 3, 5-7, 9-12, 14-16 and 18-20 relate to a method for detecting a dendritic cell or subset of DCs, comprising the hybridization of DNA obtained from cells with a DC-specific nucleotide sequence; a method for detecting a maturation stage of DC; and microarrays for these methods. For these methods, the present invention uses genes for Ig superfamily protein, DC-LAMP, interferon regulatory factor 4 (IRF4), and RNase A, which are already disclosed in D1 and D2.

D1 discloses a kit comprising polynucleotide encoding LAMP-like family member, and D2 discloses a method for detecting genes associated in DC differentiation and maturation using microarray.

It appears obvious to a person skilled in the art to arrive at the present claims 3, 5-7, 9-12, 14-16 and 18-20 without the exercise of inventive skill. Therefore, the subject matter of claims 3, 5-7, 9-12, 14-16 and 18-20 lack an inventive step under PCT Article 33(3).

Industrial Applicability

The subject matter of claims 1-20 are considered to be industrially applicable (PCT Article 33(4)).

New Citation

1. Gene Accession number AL354813 (16 May 2001)
2. Gene Accession number AF067844 (08 February 1999)